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"Reconsideration on Business Cycles in Germany, Compared with South Korea and Japan"

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1. Focus of the Study

I have made the business cycle models for Mexico, South Korea and Japan. After trying to use many indicators, I have used Investment Level (ratios of gross investment to GDP) and Economic Growth Rates as the reliable indicators.(1) The monetary crises in Mexico and South Korea were caused by the bubble economies through the inflows of short-term foreign capital. The capital outflow from South Korea in 1997 turned Investment Level downward. It had risen after the Japanese business cycle model of the 1950's and 1960's, but began to descend after the same model of the 1970's. In Mexico, the bubble economy caused by NAFTA had pushed up Investment Level, but the monetary crisis returned her Investment Level to her business cycle model.(2) These business cycle models compose Equipment Cycle, Construction Cycle, Infrastructure Cycle, or Stock Cycle, which are called the three-cycle or four-cycle schema. The long-term forecasts for the other countries will be made maintaining these schemas.

In the previous paper, I have positioned the stagnant Japanese economy in the 1990's on the depression phase of Long Wave, whose model is the four-cycle schema. I have concluded the red-ink fiscal policy would prevent Long Wave from reviving, after I have examined the relation between the ratios of government debt balance to GDP and Investment Level. Then I have argued the ecological industrial revolution[3] would be important as basic or improved innovations[4] to revolve Long Wave upward. The hypothesis that basic innovations would occur in the depression phase of Long Wave succeeded the view of Joseph A. Schumpeter (1883~1950).[5] At present, the ecological industrial revolution is breaking out globally.[6] The ecological regional integration will promote the ecological industrial revolution.[7] The ecological regional integration among several countries is based on the domestic regionalism that esteems environment and culture more than trade and capital inflow.[8] European Union is not based on a free trade agreement like NAFTA, but on a historic and cultural regionalism, which is tackling the ecological problems. Germany is considered as a pioneer of the ecological industrial revolution.[9]

Germany and Japan have been compared for a long time as the capitalist countries that are catching up the advanced countries. Therefore, I would like to know what phase of Long Wave Germany is passing. The business cycles of Germany that accomplished the national unification would be a good example for Korea. Considering EU and Germany, I would like to pay attention to the revival processes of Long Wave in Japan and South Korea and also to the possibility of the ecological regional integration in East Asia. These are the subjects of this paper.

2. Business Cycles indicated by Investment Level

Investment Levels of South Korea, Germany and Japan are compared in Figure 1. Ratios of gross investment (gross fixed

capital formation + increase in stocks) to GDP indicate the fluctuation that synthesizes Stock Cycle, Equipment Cycle, Construction Cycle and Infrastructure Cycle. Infrastructure Cycle is caused by the equipment and construction investment for basic innovations. In other words, Investment Level is combining the four business cycles and their interactions and indicates Long Wave. Thereupon, Investment Level could be assumed to circulate as a whole through upswing, downswing, depression and revival processes within the period of Long Wave.[10]

Investment Level of Germany is consistently low in comparison with Korea and Japan. While Investment Level of Korea is going after the Japanese pattern of 20 years ago, Investment Level of Germany is showing such a pattern as the Japanese pattern is pushed down. Long Wave of the postwar Germany began during the administration of Konrad Adenauer (1949~1963). It was Ludwig Erhard, minister of economics that led the economic policy during the era. His theory of the social market economy was characteristic of labor and capital cooperation strongly influenced by the Catholic social teachings, which was similar to the Japanese management.[11] During the administration of Ludwig Erhard (1963~1966), Investment Level of Germany was raised most, which could be compared with the Japanese boom from 1958 to 1962 named as Iwato Keiki. The Japanese boom preceded the German one, because the destruction in Germany during the war had been larger than that in Japan. The reaction to the era of Ludwig Erhard was the recession in 1967, which was corresponding to the recession in 1965 of Japan.

The era of Kurt Georg Kiesinger (1966~1969) was an unstable transitional stage, when Social Democratic Party was temporarily allied with CDU.[12] At that time, Willy Brandt as minister of foreign affairs had approached East Germany and Eastern Europe, and established the leading position in European Community. These policies were useful to raise Investment Level. The era of Willy Brandt (1969~1974) showed the big rising of Investment

Level. At the same time, the rising of Investment Level was seen in Japan. During the administration of Helmut Schmidt (1974 ~1982) after the first oil crisis, Investment Level in Germany descended as well as in Japan. Around 1980, it had tentatively recovered, but after that, it was descending again.

The era of Helmut Kohl (1982~1998) was twice longer than that of Helmut Schmidt. Although Investment Level in Germany continued to go sideways and recovered temporally in the later 1980's, it was stagnating after the German unification in 1990. The German unification gave a big financial burden on Germany. On the other hand, Japan fell into a bubble economy in the later 1980's and entered into the depression phase of Long Wave during the 1990's.[13] Detente policy pursued by Willy Brandt and Helmut Schmidt had resulted in the collapse of Berlin Wall on November 9, 1989 during the era of Helmut Kohl. He emphasized the Germany unification should be located in the peace and stability of European Community.[14] European Community developed into European Union in 1991, which strengthened the monetary and financial relationships.

In South Korea, Investment Level started to rise after 1961 under the military government and went up waving until Park Chung Hee, president of South Korea, was assassinated in 1979. Investment Level of Korea came to exceed that of Japan at that year. This upswing process could be compared with that of Germany during Adenauer and Erhard eras. The upswing phase of Germany is considered to show the expansion following the restoration from World War II, while that of Korea showed the restoration from Korean War and the following expansion. The period of the military government by Chun Doo Hwan (1979~1987) was in the reaction to the development-oriented economic policy adopted by Park Chung Hee. In 1982, South Korea fell into difficulty to paying out foreign exchanges and had to supplement the shortage of foreign money through rapid increases in overseas construction business and labor work, especially in the Middle

East.[15] After the Plaza accord in 1985, the prices of the Japanese products began to rise rapidly. Korea extended the exports substituting for Japanese middle and low class products, because Korean Won was almost linked with US Dollars. Investment Level of Korea started the upswing once again under the gradual democratization by president Roh Tae Woo (1987~1992). In 1991, it reached the highest peak. Although it was maintained in the era of president Kim Young Sam (1993~1998), the monetary crisis occurred in the autumn of 1997 and Investment Level entered into the downswing process.

The periods of Roh Tae Woo and Kim Young Sam in South Korea could be compared with the eras of Kurt Georg Kiesinger and Willy Brandt in Germany, because both countries were on the social and political transitional stage during those periods. And Investment Levels showed the high upswings during those periods. In 1991, South and North Korea adopted the reconciliation and nonaggression agreement. China and South Korea established the diplomatic relations in 1992. The unification policy by president Kim Young Sam set the reconciliation and cooperation stage as the first step, which emphasized the social and economic interchange including the reunion of separated families.[16] Such a policy could be compared with the eastern policy that Willy Brandt advanced during the grand coalition. Kim Dae Jung was elected president of South Korea in December 1997 just after the monetary crisis occurred in South Korea. His administration could be compared with that of Helmut Schmidt who succeeded Willy Brandt in 1974 after the first oil crisis. Putting aside the eastern policy tentatively, the both administrations had to cope with the financial crises.

If Investment Level were compared between Germany and Japan, it could be recognized that Long Waves of Germany and Japan were circulating simultaneously. On the other hand, the political resemblance of Korea and Germany could be recognized with the time lag of over 20 years. I would like to examine the

simultaneity of business cycles between Germany and Japan in the next chapter.

3. Equipment Cycle, Construction Cycle, Stock Cycle

At first, I examined Equipment Cycle and Construction Cycle in Germany by Figure 2. Equipment Cycle (ratios of equipment investment to GDP) of Germany has two high peaks in 1970 and 1991, and a low peak in 1980. That of Japan has several peaks in 1951, 1961, 1970, 1980 and 1990, which show a period of ten years. Especially, ratios of private equipment investment to GNP show the highest peak in 1970 during the economic boom from 1965 to 1971 called Izanagi Keiki. It would be the peak of investment for the basic innovations in transportation, communication, energy, etc. They had begun during the 1950's.[17] Equipment Cycle in Germany reached a peak in 1970 and 1971 after it had fallen in 1968. This peak in Germany would have been caused by the basic innovations in transportation, communication and energy as well as in Japan. The rise in 1991 would have been related with the German unification. The statistics of Germany include East Germany after this year. In the later 1990's, the equipment investment in Germany has increased in manufacturing and nonmanufacturing industries.

Construction Cycle (ratios of construction investment to GDP) in Germany showed several peaks in 1964, 1972, 1980, 1994. In Japan, the administration of Kakuei Tanaka (1972～1974) appeared on the stage and Investment Level reached the peak in 1973, when Building Cycle and Construction Cycle had risen. But the reconstruction boom of Japanese Islands caused by Kakuei Tanaka broke out through the first oil crisis. In Germany, Building Cycle and Construction Cycle showed a peak in 1972. Considering from the height and period of Cycles, the peak of 1994 were supposed to be the successive peak of Construction Cycle.

After 1970, Investment Level of Germany turned to the

downswing process. Although the temporal recovery was shown around 1980, it returned to the downswing process once again in the early 1980's because of the second oil crisis. In 1986, the petroleum price fell down and Investment Level of Germany reached a peak in 1990. This peak rose because of the rises in Equipment Cycle and Construction Cycle. During the early 1990's, Investment Level fell off owing to the slowdown in Equipment Cycle. During the later 1990's, Construction Cycle descended and Investment Level stagnated in Germany. This stagnation was related with the financial burden after the German unification. However, if the rise of Equipment Cycle in 1970 were a peak of Infrastructure Cycle in Germany, the stagnation in the 1990's would be related with the fact that Infrastructure Cycle of Germany was descending to the bottom.

I am surprised that Equipment Cycle, Construction Cycle and Infrastructure Cycle of Germany are showing the simultaneity with those of Japan that is distantly located. Germany and Japan are supposed to go after the United States according to the product life cycle model of Raymond Vernon.[18] Finally, I would like to compare Stock Cycle (ratios of increase in stocks to GDP) that reflects the short-term cycle clearly. Those of Germany and Japan are compared in Figure 3. Stock Cycle in Japan does not necessarily correspond with the turning points of business cycles. It shows the peaks in 1952, 1955, 1957, 1961, 1964, 1967, 1970, 1974, 1977, 1979, 1985, 1989, 1991, and 1997. Its average period is 3.46 years, which is close to 40 months (= 3.33 years) of Kitchen Cycle. Stock Cycle in Germany shows the peaks in 1952, 1955, 1957, 1960, 1965, 1969, 1973, 1976, 1979, 1984, 1986, 1990, 1994, and 1997. Its average period is 3.46 years, which is also close to 3.33 years of Kitchen Cycle. But the peaks of Germany do not correspond with those of Japan. And the levels of Stock Cycle in Germany ascended during the 1980's, opposite to the case of Japan. This could be explained by the raised ratios of exports to GDP, which were higher than those of Japan. Also, Stock Cycle of

Germany is showing the high peaks in 1969, 1979, and 1990, which might be overlapping with the peaks of Equipment Cycle in Germany.

4. Four-cycle Schema in the case of Germany

As mentioned in the previous papers, I have set up the following hypotheses for the four-cycle schema, in which I added Construction Cycle to the three-cycle schema of Joseph A. Schumpeter.[19] J. A. Schumpeter discerned one Juglar Cycle included three Kitchin Cycles and one Kondratieff Cycle included six Juglar Cycles. Therefore, assuming the standard period of Stock Cycle is 40 months (the average period of Kitchen Cycle), I have hypothesized the standard period of Equipment Cycle is 10 years (40 months × 3) and that of Infrastructure Cycle is 60 years (10 years × 6). Adding to the Schumpeter's hypotheses, I have hypothesized one Kondratieff Cycle includes three Kuznets Cycles and the standard period of Construction Cycle is 20 years (60 years ÷ 3). I have discriminated the variable average periods of Kitchin, Juglar, Kuznets and Kondratieff Cycles and the fixed standard periods of the substantial investment cycles. Because I have constructed the ideal models of Stock Cycle, Equipment Cycle, Construction Cycle and Infrastructure Cycle with the standard periods. It would be justified by the concept of Idealtypus in Max Weber's expression to construct such an ideal model.[20]

In the case of Germany, I have also hypothesized that Stock Cycle, Equipment Cycle, Construction Cycle and Infrastructure Cycle have the standard periods of 40 months, 10 years, 20 years and 60 years respectively. Following J. A. Schumpeter, I have assumed the periods of cycles to be the proportion of the amplitudes, which is 3.33 : 10 : 20 : 60 = 0.333 : 1 : 2 : 6. The proportion is expressed on the base of the amplitude of Equipment Cycle because the proportion of the amplitudes in the improved

three-cycle schema without Stock Cycle was assumed to be 10 : 20 : 60 = 1 : 2 : 6 in the previous papers. According to this assumption, the ideal model compounding the sine curves is presented in Figure 4. I have adopted the following formulas for the sine curves.

Infrastructure Cycle = 6 sin (360 n / 60)
Equipment Cycle = 1 sin (360 (n − 3) / 10)
Construction Cycle = 2 sin (360 (n + 8) / 20)
Stock Cycle = 0.333 sin (360 (n − 1) / 3.33)

(n) in the formulas indicates the number of the passed years from the starting year, which is assumed in 1955. I have reckoned backward that the starting year was 1955 because I assumed the peak of Infrastructure Cycle in Germany was in 1970. At that year, Germany was admitted to enter into NATO and recuperated the sovereignty completely. Therefore, it would be suitable that the starting year of the sine curve of Infrastructure Cycle in Germany was supposed to be 1955. I have assumed that the peak of Infrastructure Cycle was on Investment Level of 1970, though it was as high as that of 1965. Because the ratios of equipment investment to GDP were the highest in 1970 except in 1991 just after the German unification. As I have assumed the peak of Infrastructure Cycle in Germany was in 1970 as well as in Japan, the bottom of Infrastructure Cycle in Germany was supposed to be in 1940 and 2000 as well as in Japan.

Ratios of equipment investment to GDP in Germany showed the peaks in1970, 1980 and 1991. Therefore, the standard peaks of Equipment Cycle would coincide with the actual peaks by adjusting (n) to (n − 3). Ratios of construction investment to GDP showed the peaks in 1972 and in 1994.[21] The standard peaks of Construction Cycle would coincide with the actual peak in 1972 by adjusting (n) to (n + 8). As Stock Cycle in Germany in Figure 3 showed the higher peaks in 1960, 1969, 1979 and 1990, the standard peaks of Stock Cycle could coincide with those years by adjusting (n) to (n − 1).

The ideal models of business cycles in Germany are composed by sine curves, as shown in Figure 4. Infrastructure Cycle (the dotted line), Construction Cycle + Infrastructure Cycle (the thinly displayed line), Equipment Cycle + Construction Cycle + Infrastructure Cycle (the improved three-cycle schema), and Stock Cycle + Equipment Cycle + Construction Cycle + Infrastructure Cycle (the four-cycle schema) are shown in the same figure. The four-cycle schema is inevitably detached from the actual values, because it is an ideal model. But it would be meaningful to compare the actual values with the standard values, which could be the measure of business cycles, especially Long Wave.

In Figure 5, I have compared the four-cycle schema of Germany with the actual values of Investment Level in Germany shown in Figure 1. But the four-cycle schema in Figure 4 has been adjusted in Figure 5 through the proportion of the actual and standard values, and the average value of the actual Investment Level. The proportion of the actual and standard values is 0.52, because (max. - min.) of the actual values of Investment Level is divided by (max. - min.) of the amplitudes of four-cycle schema during 1950 and 1998. The average value of the actual investment level is 23.9. By this adjustment, the four-cycle schema is folded on the actual Investment Level. According to this adjustment method, the actual values were over the standard values during the 1960's, because the reconstruction and development process of Germany after World War II would overcome the upswing process of Long Wave as well as in Japan. But, in the 1970's, the actual Investment Level was below the standard values. We can guess the reaction of the German miracle age of Ludwig Erhard (1963 ~1966) would have been very large. Generally speaking, the downswings in 1971 and 1972 would be caused by the US dollar depreciation and the recession in the later 1970's would be influenced by the oil crises. From the 1980's to the 1990's, the actual values coincided well with the standard values again. In the later 1990's, the actual values were over the standard values.

This is because the construction investment for the German unification, the foreign investment for the development of European Union and the equipment investment for the ecological industrial revolution in Germany have increased very much.

The four-cycle schema is the ideal model composed by the sine curves of standard periods. The adjusted pattern of the ideal model coinciding with the actual Investment Level could indicate the standard values of Investment Level, which would mean the level of business cycles. According to the adjusted pattern in Figure 5, the standard values of the gross investment to GDP in Germany would show the amplitudes of 20~28%. Investment Level would be largely influenced by the trade conditions, and the fiscal and financial policies. Therefore, the separation of the actual values from the standard values is unavoidable. But it is meaningful to set up the standard values, in order to measure the factors explaining the separation. As shown in Figure 5, the bottom of the four-cycle schema in Germany is from 2002 to 2005. Therefore, Investment Level of Germany would enter into the revival process in near future.

5. Four-cycle schema and Economic Growth Rates

Next, I would like to examine business cycles indicated by Economic Growth Rates (the real economic growth rates), which fluctuate corresponding with Investment Level. In Figure 6, Economic Growth Rates of Germany are compared with those of Japan. I am surprised that the peaks and bottoms of both countries coincide relatively. Economic Growth Rates of Japan achieved the high level over 10% during the 1960's, but descended to 5%, more or less, by the moments of the dollar shock in 1971 and the oil crisis in 1973. In the 1990's, they declined to 1%, more or less. They corresponded to the upswing and downswing processes of Investment Level. Although Economic Growth Rates of Germany achieved the relatively high level in the 1950's and

1960's, they had dropped to 0% in 1967. Even if they were compared with those of Japan in the recession of 1965, those of Germany had dropped sharply in 1967. They had dropped to minus 2% in 1975 after the oil crisis, which was less than those of Japan dropped in 1974. When the debt crises in 1982 occurred in Mexico and so forth, Economic Growth Rates of Germany had dropped to the minus level. During the 1990's, they dropped to the minus level in 1993 again.

The four-cycle schema in Figure 4 indicates the standard amplitudes of Business Cycles, which signify the level of Business Cycles. Adding to the three-cycle schema, Schumpeter indicated the schema of its differential rates, which signified the standard amplitudes of the growth rate cycle. Economic Growth Rates do not always coincide with Stock Cycle. It could indicate the amplitudes of growth rate business cycles and coincide with the real feeling of the people about business cycles. Therefore, it would be as significant to compare Economic Growth Rates with the differential rates of the four-cycle schema as to compare Investment Level with the four-cycle schema.

In Figure 7, Business Cycles indicated by Economic Growth Rates is compared with the differential rates of the four-cycle schema in Germany. However, the curve of the differential rates of the four-cycle schema is adjusted by the formula (the differential rates $\times$ 3.9 + 3.8), in order to compare them with Economic Growth Rates directly. The differential rates between a year and the previous one in the four-cycle schema are multiplied by 3.9, which equals to (max. - min.) of the actual values divided by (max. - min.) of the standard values. Thereafter, the average of the actual values of Economic Growth Rates in Figure 6, that is, 3.8% is added to the multiplied differential rates.

Economic Growth Rates of Germany fluctuate largely, but almost stay within the pattern of standard amplitudes. Although the bottoms in 1967 did not coincide, the bottoms in 1975 and 1982 coincided. The peaks in 1960's, 1970's, 1980's, and 1990's almost

coincided. The standard values during the later 1990's recoverd, and the actual values also recovered after 1993. As the growth rate cycle will revolve from the depression process to the revival process sooner than the level of business conditions, Economic Growth Rates would recover sooner than Investment Level.

The slowdown of Economic Growth Rates of South Korea during the later 1990's could be compared with the slowdown of them in Japan and Germany during the early 1970's. If the differential rates of the four-cycle schemas in Japan and Germany of twenty years ago could be applied to those of South Korea, she would restore from the minus growth rate in 1998, but she would stay under 5% for the next 20 years. And after that, she would stagnate furthermore for several years. In order to escape from the adversity, it will be necessary for South Korea to accomplish basic innovations. Germany required the basic innovations, those were, the German unification and the expansion of EU, in order to get out the stagnation during the 1980's. Owing to the financial expenditure supporting this ecological regional integration, Investment Level and Economic Growth Rates of Germany were maintained as shown in Figure 5 and 6. Nevertheless, I will try to examine the influence that the fiscal expenditure is giving to Business Cycles in Germany.

6. Balance of Government Debt and Business Cycles

The four-cycle schemas are the grounds for the forecasts of Investment Levels and Economic Growth Rates in Japan and Germany. But we have seen the balances of government debt could be the factors to let Long Wave descend or decline in the cases of Korea and Japan. Therefore, I would like to examine the relations between Long Waves and the balances of government debt in the cases of Germany, Korea and Japan.

In Figure 8, the ratios of government debt balance to GDP are compared among Germany, Korea and Japan. The balance of

government debt in Germany was 1,423,600 millions of Deutsche Mark at the end of 1997, which was equivalent to 39.0% of GDP. The balance of government debt in Japan was 368 trillions of Yen at the end of 1997, which was equivalent to 72.4% of GDP. If Germany were compared with Japan, the ratios of government debt balance to GDP in Germany would be low yet. But the external debt of Germany was 661,700 millions of Deutsche Mark, which was 369,200 millions of US Dollars. The balance of government debt in Germany has been increasing after the recession of 1975, which coincided with that of Japan increasing after the recession of 1974. As you see in Figure 1 and 6, the trends of the government debt balance have coincided with the trends of Investment Level and Economic Growth Rates in Japan and Germany, which descended after 1974 and 1975, and declined during the 1990's. Nowadays, the accumulated government debt caused by the fiscal policies for the business recovery is lowering the economic growth rates. If the reconstruction of the fiscal conditions were postponed, it would take a long time for Investment Level to revolve to the revival process. It has been necessary for Germany to maintain the ratios of government debt balance to GDP under 3%, in order to establish the European currency, that was, Euro in 1999. The bottom of the four-cycle schema of Germany will come in the period from 2002 to 2005 as indicated in Figure 4. Then, if the fiscal balance turned to plus and the balance of government debt decreased, Investment Level of Germany could revolve into the revival process according to the four-cycle schema. In the case of Japan, the bottom of the four-cycle schema would be in 2004 as mentioned in the previous paper. Then, I assumed that the ratios of government debt balance to GDP would come to the bottom in 2004.[22]

The balance of government debt balance in South Korea was 47 trillions of Won at the end of 1997 and the ratio of government debt balance to GDP was 11.2% at that time. It was deteriorating from 7.5% at the end of 1991 when Investment Level

of South Korea reached a peak. The balances of government debt to GDP in Japan and Germany were 8.3% and 7.0% respectively at the end of 1970 when their Infrastructure Cycles were assumed to reach peaks, but they were deteriorating after the oil crisis. We can see they corresponded with that of South Korea during the 1990's. She had dropped into the debt crisis after the monetary crisis in 1997. The external debt increased to 153 billions of US Dollars at the end of 1997. The short-term debt, which term of payment come within one year, were 80.2 billions of US Dollars and occupied 52.4% of the total external debt. As a result of the negotiation with IMF on debt rescheduling, the 24 billions of US Dollars of the short-term foreign debt, which had been directed to the South Korean private banks, were converted to the government guaranteed finance. Thereby, the Korean monetary crisis ceased for a while. But the government debt balance in South Korea doubled in a moment and the interest payment of the 153 billions of US Dollars increased to over 10 billions of US Dollars annually. South Korea accelerated the economic growth introducing the short-term foreign capital directly by the private sectors. But when the capital-outflows occurred, there was no way to prevent the trend. Therefore, the government of South Korea was obliged to accept the private foreign debt as the public debt and the external debt crisis began. In order to prevent the ratios of government debt balance to GDP from deteriorating, South Korea had better carry out basic innovations like the ecological industrial revolution or the ecological regional integration in advance.

7. Conclusion

The equipment investment in Japan was descending during the later 1990's, which did not correspond with the standard cycle. It was decreasing in the manufacturing and non-manufacturing sectors, and also in the information technology. But it was

increasing in the environmental measures like the reduction of carbon dioxide and the energy conservation. This proved the ecological industrial revolution had been weak yet in Japan, though it had begun already. If the eco-business had not grown in Japan like in Germany, Equipment Cycle could not return to ascend.

South Korea is recovering from the monetary crisis. But if the four-cycle schemas of Japan and Germany of twenty years ago were applied to that of South Korea, the recovery of South Korea might be temporary. She could recover stably after the long depression process. The wood plantation movement through the whole country let South Korea recover from the disaster of Korean War. In 1992, the environmental protection law was established in Korea and the long ranged plan for the environmental protection during 1994~2003 was announced. In South Korea, Kondratieff Cycle is admitted by the academics and the national community including North Korea is accepted as a final target.[23] The environmental problems in South Korea and the economic interchange between North and South Korea will push the historical and cultural regionalism.

Long Wave in this time could revolve to the actual revival process if the regional integration were based on the historical and cultural regionalism connected with the ecological industrial revolution. This can be observed in the relation between Germany and EU. The economic growth in East Asia depending on foreign capitals worsened the environmental problems. Therefore, it is a time to aim the ecological regional integration through reconsidering the regional interest and conquering the old conflicts during the colonial period before World War II. This will revolve Investment Level to the revival process through connecting with the ecological industrial revolution.

End

Note

(1) Osamu Ozeki "Reconsideration on Present Phases of Business Cycles, Comparing Mexico, South Korea and Japan" The Journal of Yokohama College of Commerce, Vol32, No. 2, March 1999, p. 145. It is not difficult to find the similarity in the patterns of Investment Levels between South Korea and Japan.

(2) Osamu Ozeki "Monetary Crisis and Long-term Prospect of Economic Growth in Mexico", Business and Cycle (Journal of the learned Society on Business Cycles) No. 22, November 1996, p. 105. Investment Level in Mexico had rose greatly through the formation of NAFTA. But the Mexican monetary crisis in the end of 1994 revolved it to the pattern of the three-cycle schema.

(3) Op. cit. Osamu Ozeki "Reconsideration on Present Phases of Business Cycles, Comparing Mexico, South Korea and Japan" p. 141. The author had not taken up the ecological industrial revolution as basic innovations here for the first time. After the oil crises that spanned twice during the 1970's, the author indicated that basic innovations should be based on the system principle that satisfied the two conditions called the resource restriction and the environment restriction. Osamu Ozeki "How could the enterprises cope with the era of resource restriction?", Mitsubishi Research Institute, 1980, p. 5.

(4) Gerald Mensch "Stalemate in Technology", Ballinger Publishing Company, pp. 47-50. G. Mensch defined the basic innovations as what produced the new type of human activities. He defined the innovations derived from the basic innovations as the improved innovations.

(5) Op. cit. Osamu Ozeki "How could the enterprises cope with the era of resource restriction?", p. 3. I introduced the argument of G. Mensch depended on the Schumpeter's theory. There is the same indication in Shinohara Miyohei "The long term dynamics of world economy", TBS Britannica Co., Ltd., 1991, p. 39. Although he is not necessarily supporting Mensch, Shinohara mentioned the argument about basic innovations is succeeding the Schumpeter's theory.

(6) Carolyn Chase "The next industrial revolution" San Diego Earth Times, Dec 1998, (HYPERLINK http://www.sdearthtimes.com/et1298s7.html *http://www.sdearthtimes.com/et1298s7.html)* This article is about the conference of Industrial Environmental Association in San Diego. It is the good example that is discussing the ecological industrial revolution. Dr. S. L. Fawcett, President of Battelle Columbus research institute was discussing the ecological

industrial revolution more than 20 years ago. Dr. S. L. Fawcett "Comments from the President" The President Report & Annual Review 1977, Battelle Memorial Institute, pp. 2-3

(7) Op. cit. Osamu Ozeki "Reconsideration on Present Phases of Business Cycles, Comparing Mexico, South Korea and Japan" p. 171. I discussed the regional integrations of Japan and South Korea, and North and South Koreas. They were the historic cultural connection and the ecological regional integration, which should cooperate to tackle with the environmental problems.

(8) Yoshirou Tamanoi, "The concept of Regionalism", the cultural association of agriculture, forestry and fishing villages, 1979, p. 113. Regionalism means that the region is based on the relation between nature and human beings. It is in accord with Bioregionalism. Ann Kingsolver "Bioregionalism: The Quiet Revolution Out There" New Alchemy Quarterly, fall 1984, No. 17, New Alchemy Institute, Inc. The bioregionalism is the social experiment that has been tackled as a basic innovation from the 1980's. The bioregion conference around North America was held in 1984.

(9) Takashi Muretori "The latest report on Germany, the environment advanced country", Ecology Symphony, June 1997. He is discussing the recycling system of Germany leads the ecological industrial revolution. The recycling system of Germany would be a basic innovation.

(10) The upswing, downswing, depression, revival are corresponding to the diagram of Schumpeter and Kuznets, that is, Prosperity, Recession, Depression, Revival. Op. cit. Gerald Mensch, "Stalemate in Technology", pp. 39-40.

(11) German Information Center "German Economy: Ludwig Erhard, Germany's Economic Miracle Man, turns 100", January 28 1997 (HYPERLINK http://www.opp.uni-wuppertal.de/presse/erhard1.htm *http://www.opp.uni-wuppertal.de/presse/erhard1.htm)* The social market economy was created by Erhard and Adenauer, and grounded theoretically in the work of economist Walter Eucken belonging to "Freiburg School". The social market economy was not "pure" capitalism.

(12) Philipp Gassert, Pavel A. Richter "1968 in West Germany, A Guide to Sources and Literature" Reference Guides, Washington, D. C., December 1997 (http://www.ghi-dc.org/guide9/) The period from the grand coalition to the administration of Social Democratic Party were the era of the second structural change of Germany after the war.

(13) Op. cit. Osamu Ozeki "Reconsideration on Present Phases of

Business Cycles, Comparing Mexico, South Korea and Japan" p. 68. See Figure 6. Business Cycles in Japan:Four-cycle Schema and Investment Level.

(14) Yoichi Funabashi "Helmut Kohl, federal chancellor had been underestimated." 1998, Special Report on Germany No. 366 (HYPERLINK http://opendoors.asahi-np.co.jp/span/briefing/366.htm *http://opendoors.asahi-np.co.jp/span/briefing/366.htm*) Francois Mitterrand, president of France feared that H. Kohl might submit the neutrality of Germany to Mikhail Gorbachev of the Soviet Union in exchange for the admission of unification. However, H. Kohl followed the wisdom of Konrad Adenauer who refused the plan of Joseph Stalin that admitted the unification with East Germany on the condition of the political neutrality of Germany.

(15) Akiyoshi Horiuchi "Accumulated Debt, and Fiscal and Financial Policy in South Korea" 1991, The Institute of Developing Economies, p. 36.

(16) Hideya Kurata "The relations between North and South Korea after the death of Kim Il Song, former president of North Korea", 1996, Japan Institute of International Affairs (HYPERLINK http://www.glocom.ac.jp/lib/yama/96acnp/2bu-2-3.html *http://www.glocom.ac.jp/lib/yama/96acnp/2bu-2-3.html*)

(17) Miyohei Shinohara "Business Cycles in 50 years after World War II" Nihon Keizai Shimbun, 1994. See Figure 6 in p. 28 and also p. 20. It indicated that Kuznets Cycle would be caused by basic innovations more than by construction activities. Kuznets Cycle of Japan was descending from 1970.

(18) Raymond Vernon "International Investment and International Trade", The Quarterly Journal of Economics, 1966, p. 199. Product Life Cycle Model of R. Vernon assumed the production of new products among the United States, other advanced countries and newly industrializing countries would increase curving as if wild gooses were fling side by side. This model will induce the wild goose fling patterns of Investment Level (Ratios of gross investment to GDP).

(19) Op. cit. Osamu Ozeki, "Reconsideration on Present Phases of Business Cycles, Comparing Mexico, South Korea and Japan", p. 52.

(20) ibid. See note (16). The theory of business cycles by F. A. Hayek was also supposed to depend on Idealtypus. Op. cit. Miyohei Shinohara "Long-term Dynamics of World Economy" p. 153.

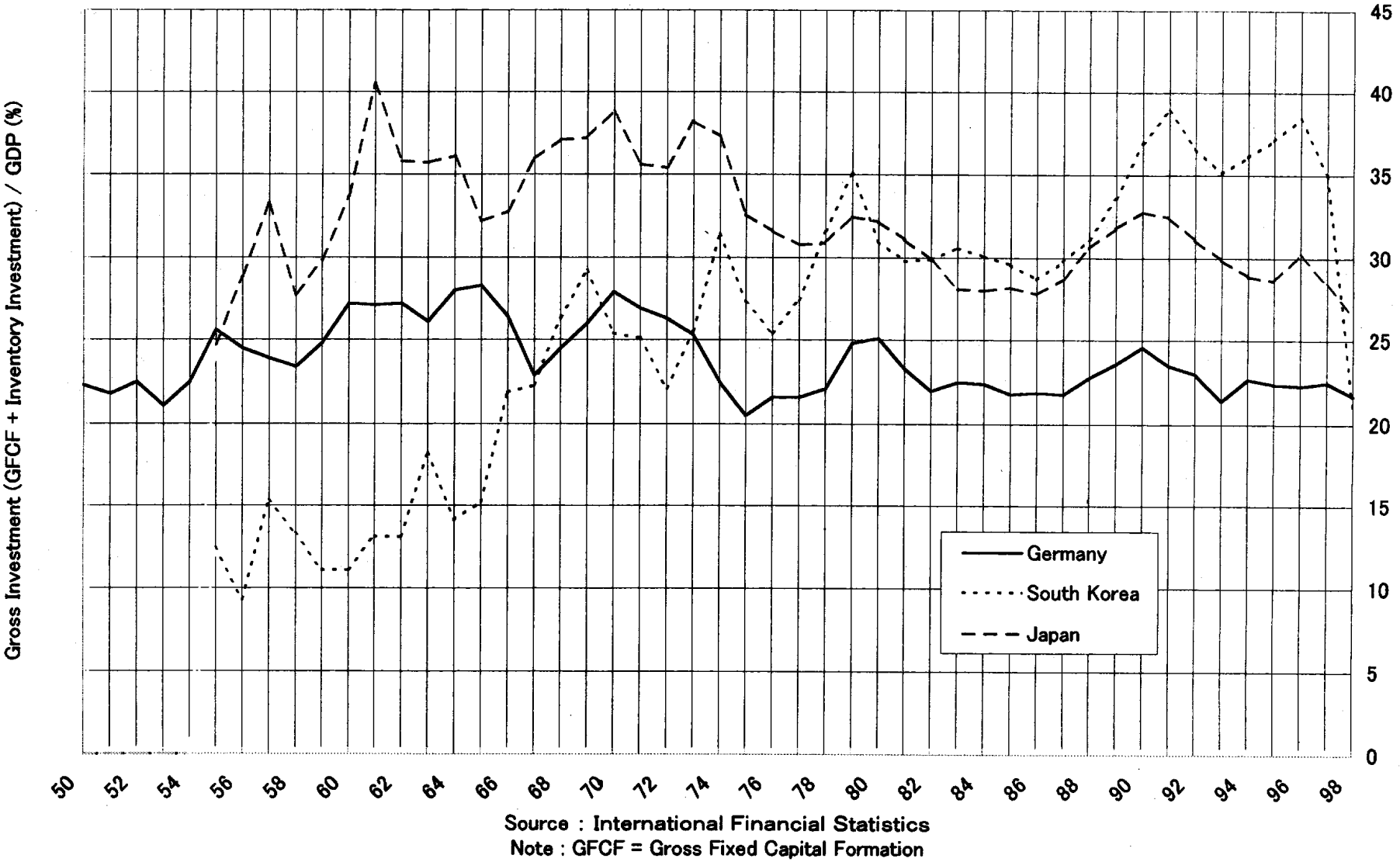
(21) German Economic Research Institute "The German Economy in the Spring of 1995" 1995, Berlin Germany (http://wuzz.diw-berlin.de/diwwbe/eb95-05/2#report.html), 1994 was the year of the construc-

tion boom after the German unification.

(22) Op. cit. Osamu Ozeki, "Reconsideration on Present Phases of Business Cycles, Comparing Mexico, South Korea and Japan", p. 57.

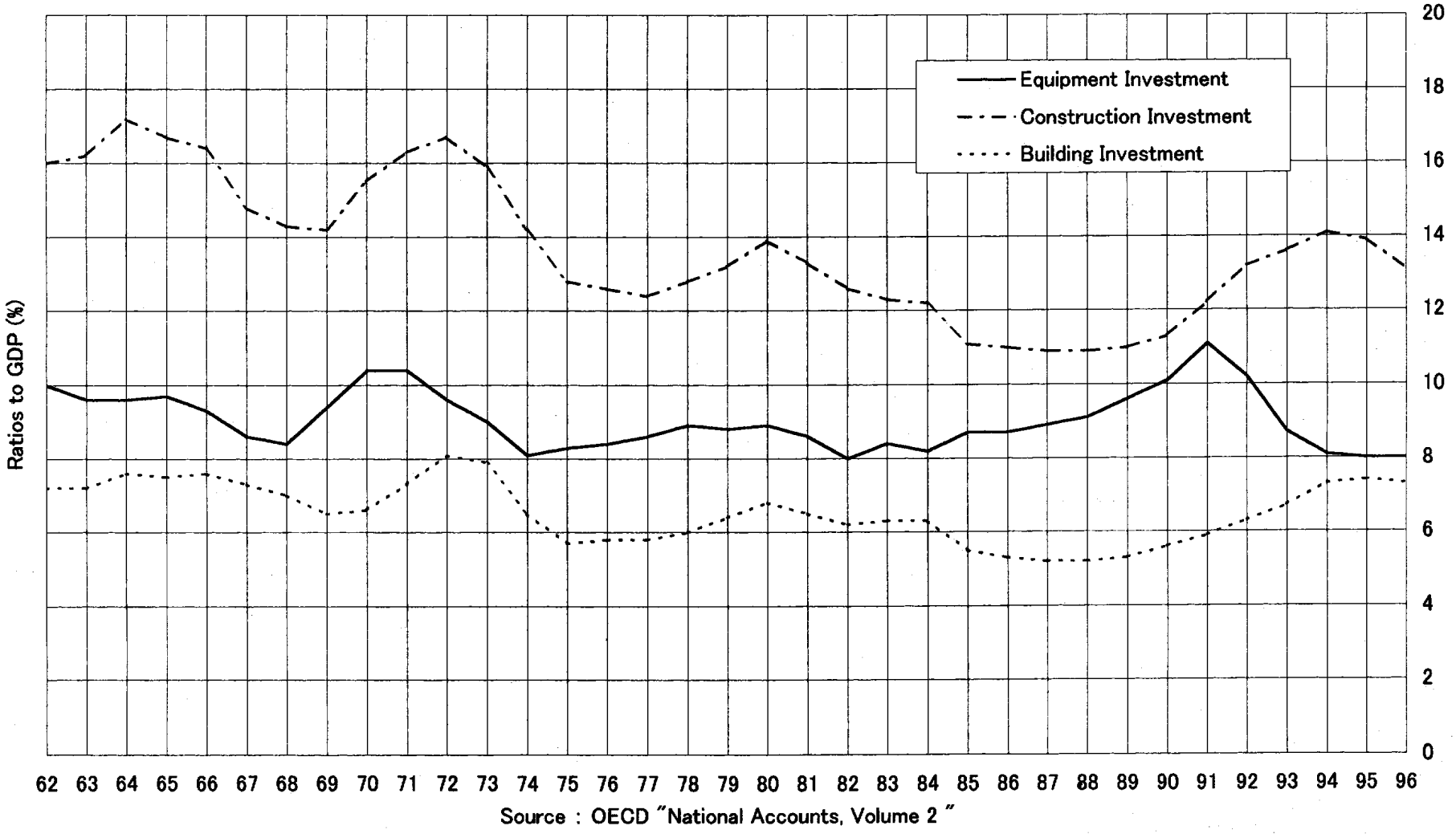
(23) Op. cit. Osamu Ozeki, "Reconsideration on Present Phases of Business Cycles, Comparing Mexico, South Korea and Japan ". See note (18). Pak Hynchu "The direction of the independent national economy for the Korean unification", which was the fourth chapter of "The Korean capitalism dispute", supervised by Honda Kenkichi, 1990, Sekaishoin, p. 139. It pointed out as follows. "The present conservative policy that is carried out against the deepening foreign subordination could not result in a good condition, as the long-term cycle of Kondratieff would be reconsidered. ……The national and capitalistic demand is to unify the adjacent market of North Korea to the national community, if the political point of view were converted completely."

Figure1. Business Cycles indicated by Investment Level in the cases of Germany, South Korea and Japan



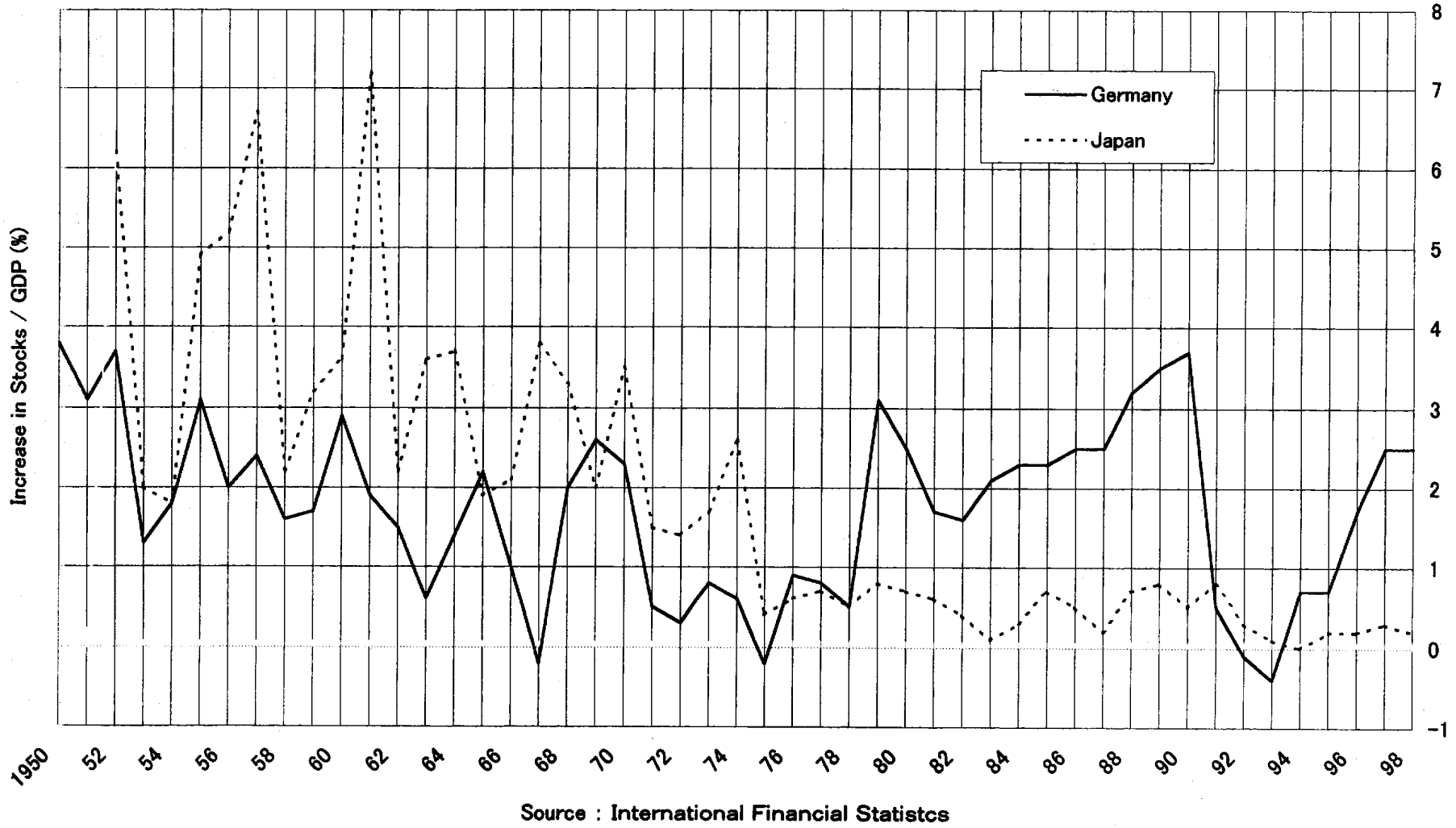
Source : International Financial Statistics
Note : GFCF = Gross Fixed Capital Formation

Figure2. Equipment Investment, Construction Investment, Building Investment : In the case of Germany



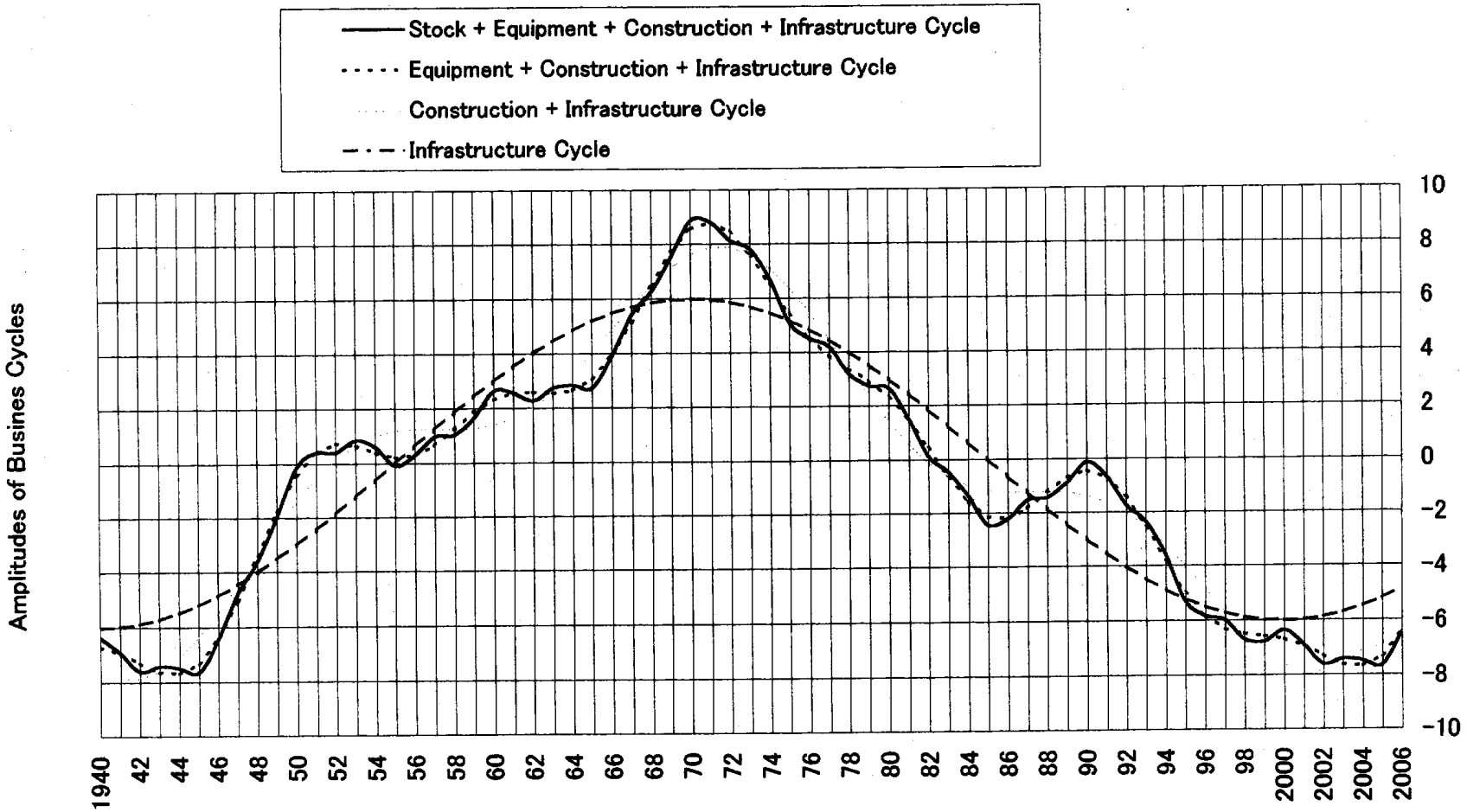
Source : OECD "National Accounts, Volume 2 "

Figure3. Inventory Investment in the cases of Germany and Japan



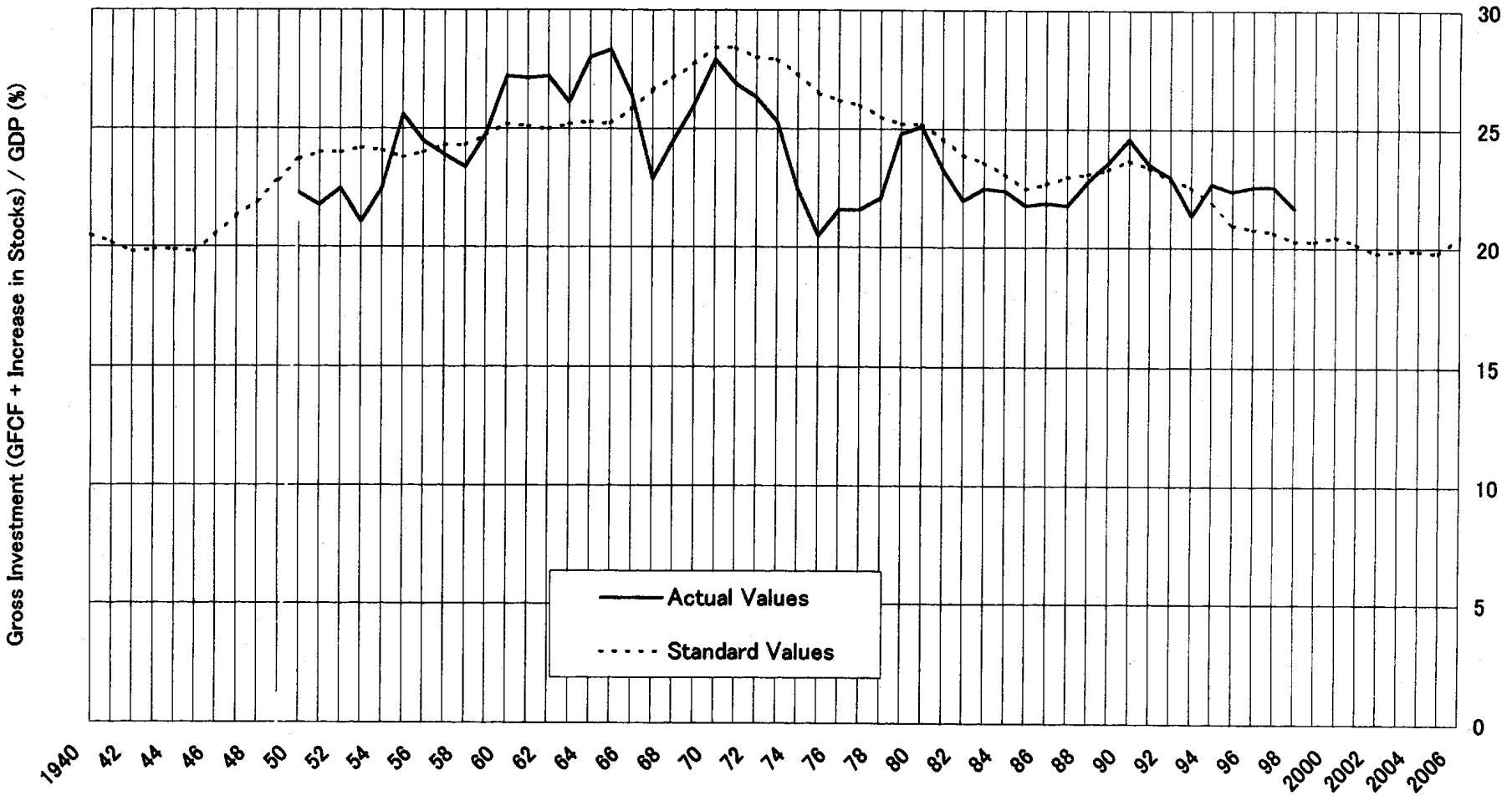
Source : International Financial Statistcs

Figure4. Models of Combined Business Cycles in the case of Garmany



Stock Cycle=0.333sin(360(n-1)/3.33), Equipment Cycle=1sin(360(n-3)/10),
Construction Cycle=2sin(360(n+8)/20), Infrastructure Cycle=6sin(360n/60)

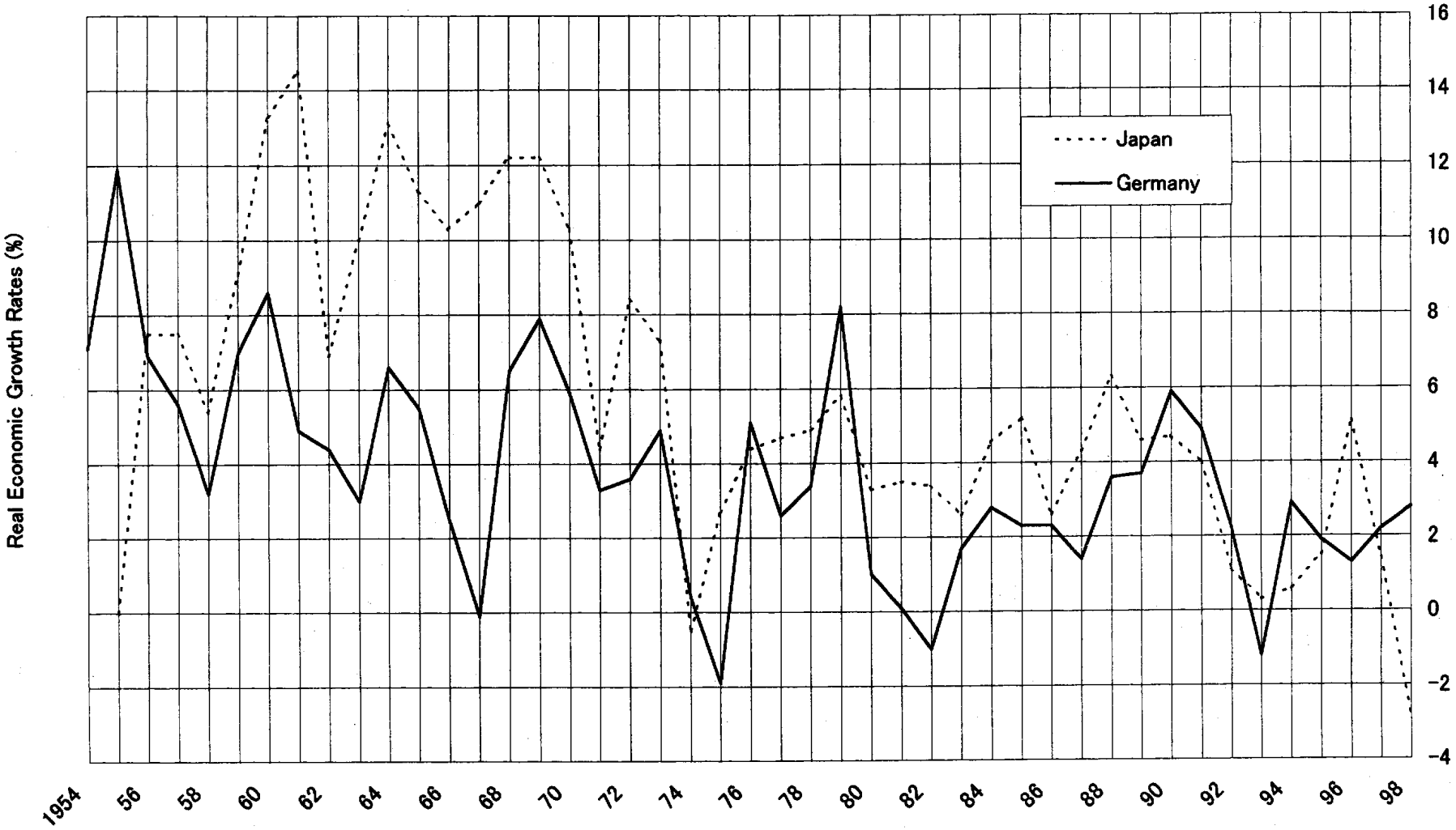
Figure5. Business Cycles in Germany indicated by Four-cycle Schema and Investment Lavel



Standard Values = (0.333sin(360(n−1)/3.33)+1sin(360(n−3)/10)+2sin(360(n+8)/20)+6sin(360n/60))*0.52+23.8

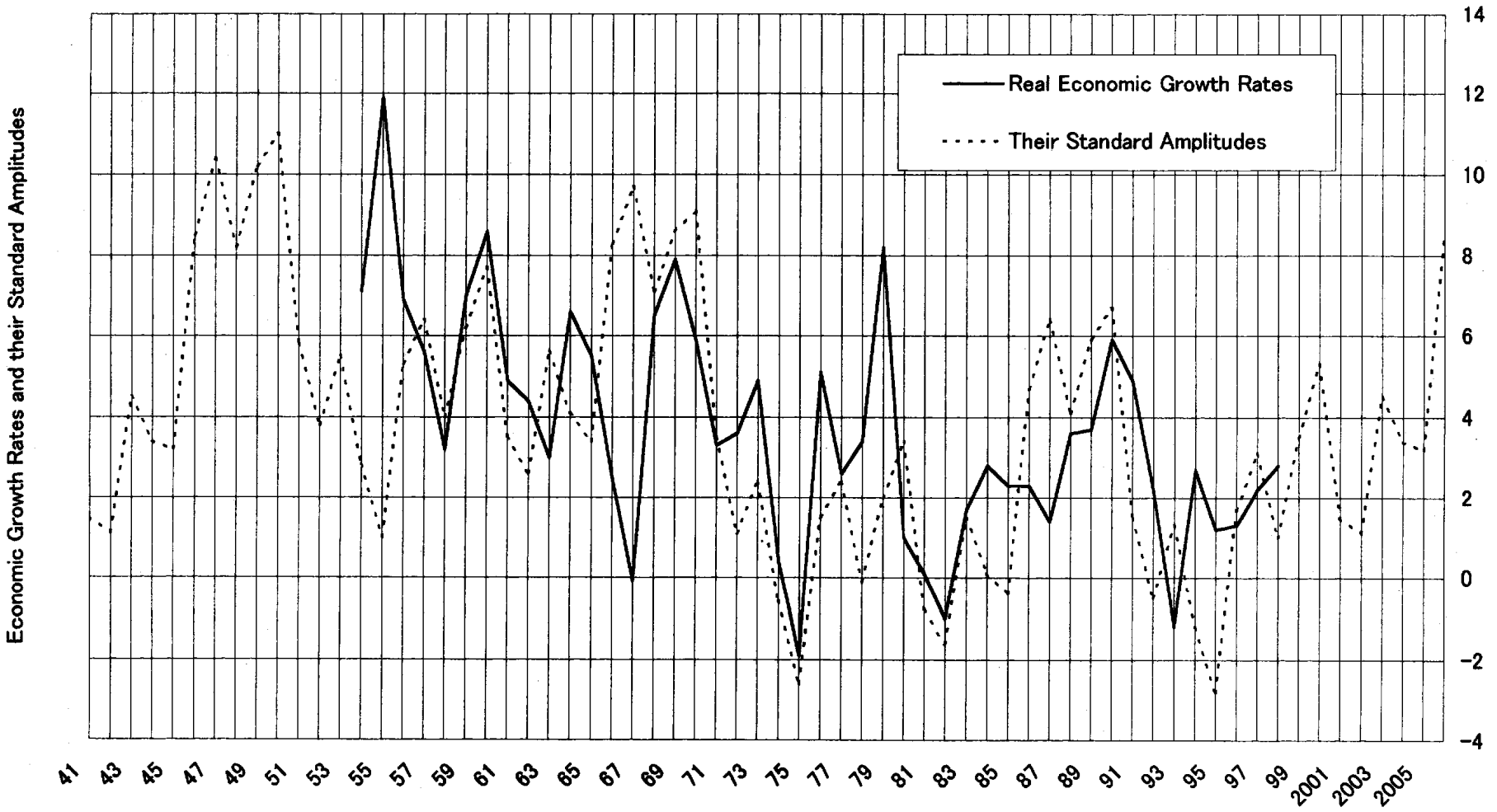
Note : 0.52 = (Max. − Min. of Actual Values)／(Max. − Min. of Standard Values), 23.8 = Average of Actual Values

Figure6. Business Cycles indicated by Economic Growth rates in the cases of Germany and Japan



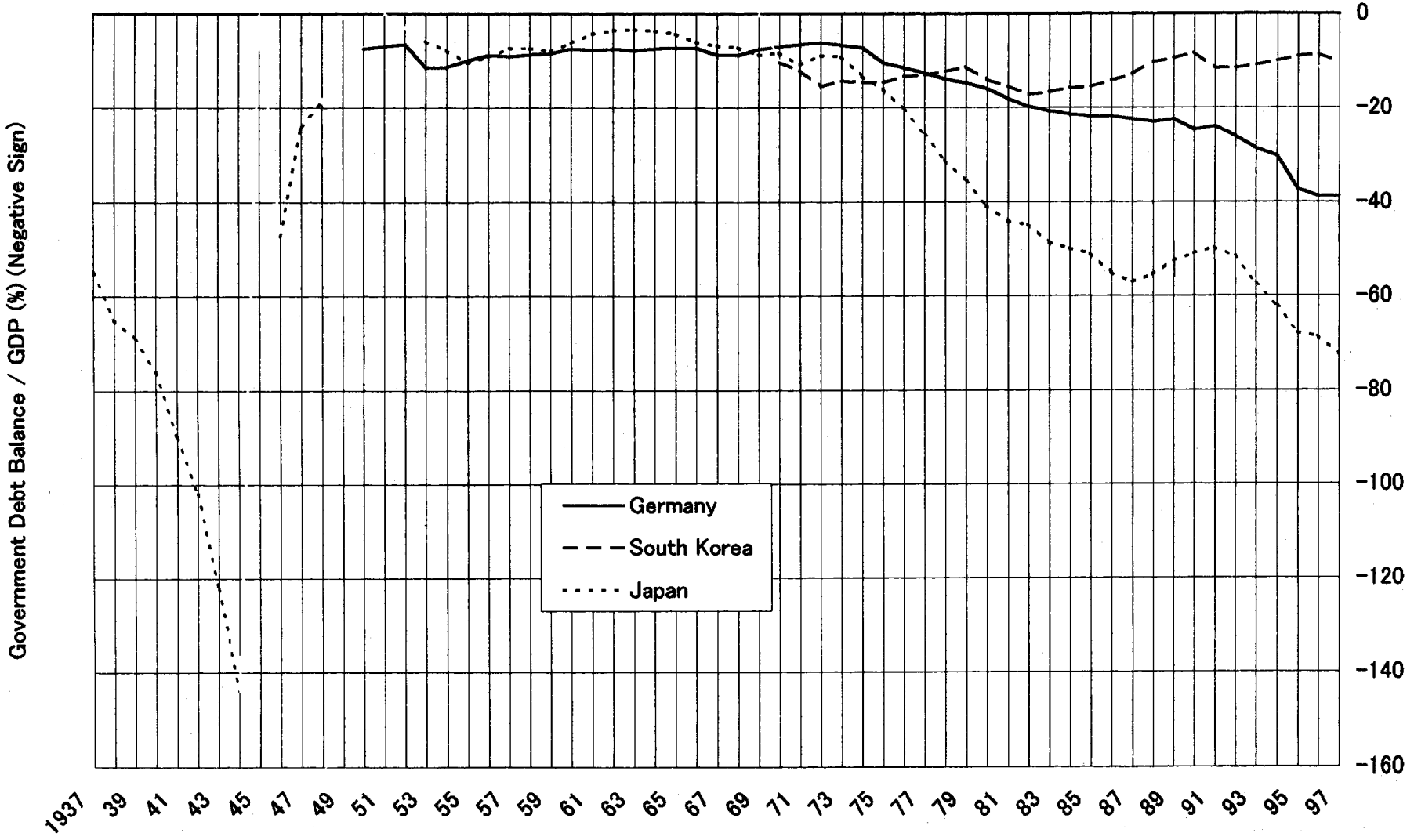
Source : IMF " International Financial Statistics "

Figure7. Differential Rates of Four-cycle Schema and Economic Growth Rates in the case of Germany



Note : Standard Amplitudes = Differences of One Year from Previous Year * 3.9 + 3.8

Figure8. Business Cycles indicated by Government Debt Balance GDP Ratio in Germany, South Korea and Japan



Source : International Financial Statistics